

REMARKS

By this response, claims 1-13, 17, 19 and 20 are pending. Compared to prior versions, claims 1-4, 7, 8, 10, 12, 13, 17, 19 and 20 are amended¹ while 5, 6, 9 and 11 appear as originally presented. Claims 14-16, 18, 21 and 22 are canceled. Substantively, claims 21-22 stand rejected under 35 U.S.C. §101 as being direct to non-statutory subject matter, but in view of their cancellation (without admission of them being non-statutory), it renders the rejection moot. Under 35 U.S.C. §102(e), claims 1-3, 5-9, 11, and 17-22 are rejected as being anticipated by Gaspard et al. U.S. Patent Publication No. 2003/0112764. Also, claims 4, 10, 12-16 are rejected as obvious under 35 U.S.C. §103(a) over Gaspard et al. in further view of Kracht U.S. Patent No. 6,516,345. In view of the following, the Applicant requests reconsideration.

Although variously worded, each claim requires a solution to the problem of automatically determining network topology in situations where next-hop routers, or routers beyond the next-hop routers, have been “assigned unknown destination network numbers,” such as (0.0.0.0). As described in the background of the invention section:

many routers from Cisco and Nortel assign a value of 0.0.0.0 to the address of the next hop router (the ipRouteNextHop if SNMP protocol is utilized). Therefore, use of these methods can fail to identify a distinct and meaningful value for an unnumbered interface of a router. *Applicant's specification, p. 6, ll. 14-17.*

Solving the problem, the invention in the example of Figure 4 teaches each router (routers 2, 4, and 5) relative to router 1 having some sort of an unknown destination network

¹ Some of the claim amendments relate to proper usage of antecedent basis, and the Examiner will readily recognize them without a detailed discussion herein.

value such that routers 2, 4 and 5 via interface 2 are either a next-hop router (routers 2 and 3) or a router beyond the next-hop (routers 4 and 5). (Similarly, routers 1, 4 and 5 are next-hop routers of router 2 and each has an unknown destination network value, as does router 1 relative to router 3. In turn, router 2 is a next-hop of routers 4 and 5 and has an assigned unknown destination network value, as does router 1 beyond the next-hop router of router 2.). By way of a connected router list (e.g., Route Table, p. 17), sorting each of the connections per each of the routers relative to the other routers reveals the unnumbered links between the routers, including being able to know the next-hop routers in contrast to the routers beyond the next-hop. At steps 46, 48 and 16, for instance, this occurs by way of determining connections over different interfaces relative to each router of the router list, including step 52 for example. The invention then defines over Gaspard and Kracht.

Namely, neither Gaspard nor Kracht relate to identifying network topology where next-hop routers, or routers beyond the next-hop routers, have been assigned unknown destination network numbers, such as (0.0.0.0) during utilization of SNMP protocol, for example. Rather, both know a local port number of the routing device and an IP address of the next-hop routing device, which greatly assists in determining topology. In Gaspard, this is seen in Figure 5, for example, where router 510 has an unnumbered local port 2, interface 560, connecting to a router 520 having an IP address of 110.55.154.15. Similarly, router 520 connects at its unnumbered local port 2, interface 580, to the router 510 having an IP address of 64.56.7.77. When determining network topology, e.g., Figure 6, *paragraphs [0052]-[0059]*, Gaspard knows the interface index of the first router and the neighboring, or next-hop router's IP address, e.g., step 615, step 635. In the event the interface index and the neighbor IP address are known endpoints, e.g., step 645, the auto-discovery process of network topology ends, step 675 (provided there are no more pairs to consider at step 650). On the other hand, if the two are not already known as endpoints, the old IP link is deleted, step 665, and a new IP link is substituted. The same is also true in Figures 3, 4 and 7a-7c,

and their attendant written description. Nowhere, however, is there any teaching of discovering network topology when assigned destination network values are unknown values, such as a 0.0.0.0, as the claims require. For at least this reason, the invention defines itself over the art.

In Kracht, Figures 2A-2C, 4, 5A-5B, 7 and 8 teach next-hop IP addresses and known local ports for each of its routers and nowhere is it suggested that certain of the routers have unknown destination network values. While Kracht indeed infers the use router lists, the present invention is not so broadly defined. Rather, the invention uses the connected router lists and examines the interface connections between other routers to determine next-hop routers (immediate neighbors) and beyond next-hop routers, despite being assigned unknown destination network values.

In particular claims, nowhere does Gaspard alone or in combination with Kracht teach the following:

Claims 1-13: “identifying” the “connected” routers or routing devices reachable through an “unnumbered interface” including the “next-hop routers” and “routers connected beyond the next-hop routers” wherein one of the next-hop routers and one of the routers connected beyond the next-hop routers have an “assigned unknown destination network number.”

Claims 1-7: including the above, plus the step of “repeating” the foregoing and “identifying an unnumbered interface for each router in the network.”

Claims 3, 9 and 10: “determining” whether the immediate neighbor or other routing device “connects to the unnumbered interface and to” others, e.g., beyond the next-hop routers, “over different interfaces.”

Claims 17, 19 and 20: “at least two network devices connected to one another in a next-hop configuration, ... wherein the one device and the other device each has an assigned unknown destination network number corresponding to the other device and the one device, respectively;” and a network management system (NMS) is configured to access the network

management information data on a "connected router list," further including configuration of the NMS "to examine the connected router list and compare each said interface assignment of the two network devices and determine whether the other device connects to the one device over a different interface assignment than the other device connects to still another network device having the assigned unknown destination network number."

For at least the foregoing, the claims are submitted as being in a condition for allowance and the Applicant requests a timely Notice of Allowance be issued for same. *To the extent any fees are due, although none are believed due, the undersigned authorizes their deduction from Deposit Account No. 11-0978.*

Respectfully submitted,

KING & SCHICKLI, PLLC



Michael T. Sanderson
Registration No. 43,082

247 North Broadway
Lexington, Kentucky 40507
Phone: (859) 252-0889
Fax: (859) 252-0779